

REMARKS/ARGUMENTS

Claims 1 -24 remain in the application. Claims 25 - 37 have been cancelled.

Examiner Huynh is thanked for carefully reviewing the subject patent application.

All claims under consideration are now believed to be in allowable condition, and allowance is so requested.

I. The Amendments

Claim 6 was amended at line 2 and claim 7 at line 1 by inserting "upper" before the phrase "oxygen doped SiC layer" according to the examiner's request. Similarly, independent claim 13 was amended at line 7 by inserting "upper" before "oxygen doped SiC layer" and dependent claims 19, 20, 22 - 24 were amended to reflect the change in claim 13.

Claim 19 was also amended at lines 1 and 2 by replacing "SiC in said barrier/etch stop" with "lower silicon carbide (SiC)". This change is in agreement with the specification on page 9, lines 18 – 20 and has the proper antecedent in claim 13 at lines 5 and 6.

II. Rejection under 35 U.S.C. 103 (a)

Reconsideration of the rejection of claims 1 - 8, 11 - 21, and 24 under 35 USC 103 (a) as being unpatentable over Cho et al. (USP 6,486,082) in view of Gibson et al. (USP 6,879,046) is requested, in light of the following.

The Applicants respectfully submit that Gibson does not teach that the lower layer 11 in the composite barrier layer 9 is comprised of silicon carbide (SiC) but rather "may be silicon nitride or nitrogen doped silicon carbide" as stated in column 5, lines 25 and 26. Furthermore, lines 35 - 38 (col. 5) specifically point out that "A fundamental concept of the present invention is that lower barrier layer 11 is a nitrogen containing film and is substantially free of oxygen". This concept clearly teaches away from a SiC layer as the bottom layer in a composite barrier/etch stop as claimed by the applicants. The applicants also point out that Cho indicates the barrier layer 312 is a single layer and does not teach a composite layer to control the oxidation of the conductive features 310. Instead, Cho suggests (col. 9, lines 59-63) that silicon nitride be used as the barrier layer 312 for improved control of Cu diffusion and Cu oxidation.

The Applicants respectfully submit that none of the applied or known references address the claimed invention as described in claims 1 and 13 in which a composite barrier/etch stop layer comprised of a lower SiC layer and an upper oxygen doped SiC layer is formed between a substrate and an overlying dielectric layer. The claimed invention is believed to be patentable over the prior art cited, as it is respectfully suggested that the combination of the Cho and Gibson references cannot be made without reference to the Applicant's own invention. Cho refers to a single barrier/etch stop layer while Gibson's composite barrier/etch stop has a lower layer made of a nitrogen containing material. Applicant has claimed his process in detail. The processes of FIGS. 1 - 5 (claims 1 - 8, 11 - 21, and 24) are believed to be novel and patentable over the applied references because there is not sufficient basis for concluding that the combination of claimed elements would

have been obvious to one skilled in the art. That is to say, there must be something in the prior art or line of reasoning to suggest that the combination of Cho and the Gibson patents is desirable. We believe that there is no such basis for the combination.

Reconsideration of the objection to claims 9, 10, 22, and 23 is requested since the amended base claims 1 and 13 are now believed to be patentable.

With regard to the Examiner's statements concerning claims 7, 8, 20, and 21 on page 6, the PECVD process (col. 9, lines 55-56) and examples (col. 12, line 11 – col. 13, line 46) refer to deposition of the low dielectric constant film 314 and not to the SiC layer 312.

With regard to the Examiner's statement concerning claims 11 and 24 at the top of page 7, the process flow described by Cho (col. 9, lines 55-58) refers to the formation of the SiC layer and does not describe a plasma treatment of a SiC layer after said layer is formed.

All claims are now believed to be in condition for allowance, and allowance is so requested.

It is requested that should there be any problems with this Amendment, please call the undersigned Attorney at (845) 452-5863.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'SBA', with a long horizontal flourish extending to the right.

Stephen B. Ackerman, Reg. No. 37,761